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ABSTRACT

This paper applies questions of coverage, quality and linkages to the current collection of national statistics on education at the preprimary, elementary/secondary, and higher education levels. The main questions raised at the preprimary level pertain to availability of programs, standards, and family-school interaction. At the elementary/secondary level, the policy debate revolves around questions relating to educational improvement, resources effectiveness, and equity. National data bases provide little help in answering these questions, and the quality of data varies. At the higher education level, data sources are considered as they pertain to student aid, efficiency, educational value, and role of higher education. The following recommendations are made for improving the national data: (1) eliminate low priority data items; (2) identify and fill information gaps on a priority basis in areas of major policy interest; (3) establish an office of quality control; (4) give highest priority to improving quality of elementary/secondary education data; (5) modernize procedures for data collection; (6) investigate the feasibility of linking the most costly data collection systems in the Department of Education; (7) initiate discussions with representatives of other agencies to coordinate data collection; (8) in developing questionnaires, consider those variables that have been shown to be most important to outcomes; (9) establish an education data bank to improve survey consistency across data bases and over time; and (10) keep expectations high. (JAZ)

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ASSESSING NATIONAL DATA ON EDUCATION

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ASSESSING NATIONAL DATA ON EDUCATION

Gauging the condition of education in the United States necessarily involves some assessment of how well the gauges work. Are our information systems measuring key indicators? Do they provide accurate readings? Are they optimally linked? In this assessment, we apply these questions of coverage, quality, and linkages to the current collection of national statistics on education at the preprimary, elementary/secondary, and higher education levels. At each level, we discuss fundamental policy issues, summarize major data bases, and evaluate the potential of existing data to inform policy discussions. In the final section, we recommend ways to improve the collection of national statistics on education.

DATA ON PREPRIMARY EDUCATION

Concern about preprimary education in the United States has been stimulated by rising participation rates and a recent upturn in the population of preschool age. Heightening the concern is conflicting evidence over the importance of such education for later achievement. Results from the Perry Preschool Project (Berrueta-Clement et al., 1984) and earlier collaborative work (Lazar et al., 1974) indicate that preschool experience has sustained benefits for disadvantaged children. These results have been used to justify expansion of publicly supported preschool education. Critics, however, have argued that these findings are not applicable to most preschool programs.

The heightened interest in preschool education and disagreement over its effectiveness have generated a need for information on what education is currently being provided to preschoolers, what outcomes should be expected, and how preprimary programs complement learning in the home. A number of questions have been raised:

- o Availability. What types of preschool programs are available? What types of children participate in various programs? To what extent is preschool education available to low-income families? How are programs supported? What is the mix of public and private funds? Is the current pool of preprimary programs adequate to meet the demand? Can it meet future demand?

- o Standards. Under what standards do preprimary programs operate? Do standards differ by community, family background of participants, and sponsorship? What standards distinguish high-quality programs?

- o Family-school interaction. How do preprimary programs complement learning in the home? How do families, in turn, reinforce preschool learning?

Only a half-dozen surveys collect nationally representative data relevant to these policy concerns. Table 1 shows the six data bases and the categories of information they cover. Responsibility for government-sponsored surveys is divided among various federal agencies. The Education Department surveys that gather some preschool information include the Common Core of Data (CCD) on public school systems and the High School and Beyond (HSB) longitudinal study of the National Center for Education Statistics, and the National Assessment of Educational Progress (NAEP) of the National Institute of Education. CCD provides statistics on kindergarten and prekindergarten enrollment in regular public school systems and full-time-equivalent teachers at this level. HSB and NAEP ask students to report retrospectively on whether they had been enrolled in preprimary programs.

The Bureau of the Census collects data annually on preprimary enrollment and occasionally on child-care arrangements of working mothers through the Current Population Survey (CPS). The Department of Health and Human Services (HHS) data collection on preprimary education is now limited to an annual Head Start survey, but in 1976-77 HHS also undertook a comprehensive study of day-care centers. Although the 1976-77 National Day Care Study was a one-time study, it may suggest a model for future data collections and is included among the data discussed here.

Data Coverage

Without knowledge of the current availability of preprimary education providers, it is difficult to assess how well enrollment demand is being accommodated now and is likely to be accommodated in the future. To answer these questions, policymakers need information on enrollments in various types of preschool programs, costs of services, and access of different population groups to preschool programs.

National data are available on participation in public and private nursery schools and kindergartens from the CPS. Despite the growing interest in private sector involvement in providing educational services, however, there is no information on the type of provider (whether nonprofit or profitmaking) and on sponsorship (whether church, employer, or community-sponsored).

The availability of services to different population groups may hinge on costs and the ability to pay for such programs but data are sparse on costs for preprimary programs. The National Day Care Study collected fairly extensive data on expenditures, revenue sources, fees, donated resources, and staff salaries, but these data applies to only one type of preprimary program, licensed day care, and the data are a decade old. In response to special requests from the Education Department, the CPS asked for information on tuition paid for private nursery schools and kindergartens in 1979 and 1982. But tuition data are not routinely collected in the CPS and can be tied to only a few program characteristics. The Head Start program annually estimates its average cost per child, but expenditures for Head Start cannot be generalized to other preschool arrangements. Moreover, the Head Start program serves only one in four of the eligible low-income children and provides no data on the total need for preschool care among low-income populations or on cost barriers to providing such care.

TABLE 1: VARIABLE CATEGORIES COVERED BY SELECTED PREPRIMARY EDUCATION DATA BASES

Data bases	Outcomes	Processes--curriculum, climate, standards	Resources	Student background
Education Department				
Common Core of Data (CCD)	--	--	◺	--
High School and Beyond (HSB)	◺	--	--	☐
National Assessment of Educational Progress (NAEP)	☐	--	--	◺
Other Federal Agencies				
Current Population Survey (CPS)	--	◺	--	☐
Head Start annual survey	--	◺	☐	☐
National Day Care Study (1976-77)	☐	☐	☐	☐

☐ = Complete data

◺ = Incomplete data

-- = No data

Questions of standards for preprimary education--and government involvement in setting standards--are being discussed in state legislatures across the nation. Informed debate requires knowledge of what constitutes adequate standards and how well existing services match these standards. Moreover, in defining an adequate level of service, it is important to know the extent to which preschool experience affects a child's short- and long-term progress in school. Questions to be addressed in establishing standards include these: What credentials should staff have? What represents an acceptable staff-to-child ratio? How much time should young children devote to structured learning activities?

Information on the quality of current programs is virtually nonexistent, lacking the most basic data on preschool processes and outcomes. The evidence from effective preschool programs points to the importance of the quality issue. The Perry Preschool Project, which yielded long-term benefits for young children from disadvantaged homes, stressed the "high quality" of the program, as measured by high staff-to-pupil ratios, extensive home visits, and a fully articulated curriculum.

The last national attempt to gather comprehensive information on preschool processes was the National Day Care Study in 1976-77. This study identified variables that appeared to improve children's gains in test scores, such as the specific child-related education of the caregiver, a finding that has implications for teacher certification.

The Head Start program's ongoing annual survey asks for information on staff credentials in early childhood education, but does not ask for any child performance measures beyond the number of children who drop out of the program, thereby missing an opportunity to link standards with outcomes.

Data from HSB and NAEP also could potentially tie participation in preschool with later performance, but retrospective reporting and the fact that nothing is known about the characteristics or quality of these programs limit the utility of these data.

"If studies of school achievement have shown one thing, it is the importance of the family," concludes Coleman in his latest study of schools (1982, p. 19). To assess the preschool experience, it is critical to discover the complementary nature of preschool-home relationships. For example, how much time do parents spend participating in learning activities with their children? What home learning activities are most beneficial? What are the net effects of preschool education in relation to the home environment?

Only one national data base provides any reasonable information on home activities for children. The University of Michigan Time-Use Study gathered information in 1975 and 1981 on parent-child interaction through home diaries, but this study included too few young children to focus on the preschool years and did not collect performance data for this age group.

Indeed, no national surveys have looked at the home environment and the preschool environment together to suggest how learning may be reinforced or confounded by different settings. Some researchers have posited that the "hidden curriculum" provided in middle-class homes exerts so strong an influence on learning that instruction offered in a formal preprimary setting yields no net learning benefits for middle-class youngsters. Current national data bases provide no information with which to address this subject.

Data Quality

Data availability is obviously the largest problem at the preprimary level, but accuracy is also a concern. When the various data bases do overlap, they may not agree. For example, public preprimary enrollment reported through CCD shows some half-million children fewer than the 3.5 million estimated from the CPS household survey.

An examination of the CCD suggests that some local school districts and state education agencies have difficulty reporting accurate preprimary enrollment and staffing information, particularly in distinguishing between headcount and full-time-equivalent enrollments. Yet household respondents in the CPS may be equally inaccurate in reporting preprimary enrollment. Although the CPS distinguishes between home day care and formal preprimary programs, it leaves the classification of center-based day care to the household respondent. Thus, the rather thorny problem of defining center care as instructional or custodial is left to the respondent and presumably this definition could vary from one respondent to the next.

Data Linkages

A major hindrance to progress in developing data on preprimary education is the fact that no single agency has a clear mandate to collect the information. The Department of Education is just beginning to formulate proposals to address the area of early childhood education. The largest federal education program at the preprimary level, Head Start, is administered outside the Department of Education by HHS. In recent years, HHS has all but closed down its statistical collection activity in preprimary education, except for annual reporting on Head Start. The comprehensive but costly ($7 million) National Day Care Study in the late 1970s required a commitment of resources that are no longer available. With no agency yet assuming the lead in this area, data collection efforts have been sporadic, piecemeal, and uncoordinated.

DATA ON ELEMENTARY AND SECONDARY EDUCATION

Concerns with improving education dominate issues in elementary and secondary education. Various reports have called attention to performance declines over the recent past and the need to upgrade American education, spurring many states to pass costly reforms. Policymakers, educators, and the public need to be able to assess whether these reforms are working and whether they are getting their money's worth. In addition, the drive toward excellence has heightened the concern about providing equal opportunity to all students. It is generally recognized that if the Nation's schools are to improve, everyone should be encouraged to share in this improvement. Current policy debates revolve around these questions:

- o Educational improvement. Are educational reforms actually improving student outcomes?

- o Resource effectiveness. Are resources being applied to promote cost-effective educational programs?

- o Equity. Are the needs of disadvantaged and other special population groups being met?

Although a number of national data bases describe different aspects of elementary and secondary education, three that have already been mentioned stand out as the major ongoing sources of national information, as shown in Table 2. The CCD survey of all state educational agencies and local school districts, is the primary source of information on schooling inputs--enrollment, finances, and staffing. NAEP focuses on measuring educational outcomes. The HSB longitudinal survey is the only one with extensive information on family background, school process variables, and student outcomes. Specialized information on elementary and secondary education is available from various other NCES surveys: the Private School Survey; the Survey of Teacher Demand and Shortages; and the Library/Media Center Survey.

With respect to particular populations of special concern to the federal government, the Office for Civil Rights surveys districts and schools for information on programs, disciplinary actions, and graduating class composition. Individual federal education programs, such as those serving the handicapped or the limited-English proficient, conduct their own surveys of participants and coverage.

Other federal agencies and private organizations also provide elementary and secondary education data. The CPS, mentioned earlier, supplies annual data on enrollment, public and private, and educational attainment. The Justice Department collects information on school discipline. HHS funds "Monitoring the Future," an annual survey of high school seniors which focuses on student attitudes and drug abuse. The National Science Foundation (NSF) conducts studies on math and science education. The Labor Department's National Longitudinal Survey--Youth Cohort (NLS--Youth) contains extensive information on family, schooling, and work history. A private consortium, the International Association for the Evaluation of Educational Achievement (IEA), periodically assesses comparative student performance in various nations. The National Education Association (NEA) collects information from its state coordinators on enrollment, staff, and salaries.

Data Coverage

As a result of the clear demand for school improvement and the expenditure of billions of dollars on educational reforms, information is critically needed on whether these reforms are improving outcomes and which reforms seem most effective. Ultimately, data should indicate whether student performance, as measured by educational achievement and attainment, has improved and for

TABLE 2: VARIABLE CATEGORIES COVERED BY SELECTED ELEMENTARY AND SECONDARY EDUCATION DATA BASES

Data bases	Outcomes	Processes--curriculum, climate, standards	Resources	Student backgrour
Education Department				
Common Core of Data (CCD)	--	--	◺	--
National Assessment of Educational Progress (NAEP)	▢	◺	◺	▢
High School and Beyond (HSB)	▢	◺	◺	▢
Private School Survey	--	--	◺	◺
Teacher Supply and Demand Survey	--	--	◺	--
Library/Media Center Survey	--	--	◺	--
Civil rights survey	◺	◺	--	◺
Special education program surveys	--	◺	◺	◺
Language minority surveys	--	--	--	◺
Other Federal Agencies				
Current Population Survey (CPS)	◺	--	--	▢
Justice Department surveys	--	--	--	▢
National Science Foundation (NSF) surveys	--	◺	◺	--
National Longitudinal Survey--Youth Cohort (NLS--Youth) (Labor Department)	▢	◺	--	▢
Monitoring the Future--Drug Abuse (Health and Human Services)	--	◺	--	▢
Private Organizations				
International Association for Evaluation of Educational Achievement (IEA)	▢	▢	--	--
National Education Association (NEA)	--	--	▢	--

▢ = Complete

◺ = Incomplete data

-- = No data

whom. This information should be available nationally, but also disaggregated at least down to the state level, since the states are primarily responsible for education.

Most of the national data bases listed in Table 2 provide little help in answering these questions. Few provide performance information. The extensive data collected on resources can report little about the quality of inputs, such as the quality of teachers. A few data bases contain some information on schooling processes, but the data often apply to highly specific areas such as the provision of special education for the handicapped.

HSB presents reasonably good information on school outcomes and processes, but its performance test is limited to only a few items. The information pertains only to high school processes and tells us little about experiences before high school. The national data are of little help to particular states working to evaluate their systems.

NAEP offers some advantages over HSB in assessing reforms. NAEP's tests are much more extensive than HSB's and are not limited to high school students. NAEP also surveys the schools more often than HSB. Furthermore, although NAEP initially focused on outcome data, it has expanded its information on classroom processes and school and teacher characteristics, and it contains some home background information.

But NAEP also has disadvantages. First, NAEP is subject specific, that is, in a given year, NAEP focuses primarily on a few learning areas instead of providing a comprehensive picture of what is happening within the whole school. Second, NAEP consists of repeated cross sections and cannot be as informative as HSB with respect to measuring transitions over time, such as dropping out of school. Furthermore, like HSB, NAEP cannot provide state- or district-level comparisons. The current NAEP design does allow states to expand the sample to provide representative scores, but to date only three states have done so. Thus, although states carry the primary responsibility for education, the nation has no way of accurately assessing how well state governments are carrying out these responsibilities.

Other data bases provide additional information on reform, but all are limited in important respects. IEA compares achievement in a number of countries, but the data are highly aggregated and the long intervals separating reports (sometimes 15 years) makes IEA unsuitable as a gauge of reform effects.

On the question of resource effectiveness, research findings have shown that overall expenditures and student performance are only weakly associated. Hence, to examine the quality of resources and the ways they translate into school processes, statistics must be collected below the level of broad expenditure components.

The CCD annually collects revenue, expenditure, and debt-financing statistics on some 16,000 school districts. Some of these data are important for assessing efficiency issues, such as breakouts of administration and instructional components of expenditures, but many of the items hardly warrant reporting each year. On the other hand, despite the concern over the quality of teachers--the most critical resource, CCD no longer collects information on what each state pays its teachers.

Because administrative records on inputs are readily available, data are often collected without sufficient regard to priorities. Library statistics, for example, are able to provide data on a full range of variables. Although libraries are essential for education, something is wrong when NCES can report periodicals' costs but not teachers' salaries.

Measuring how well groups with special needs, such as language and racial minorities, are faring as a result of reform efforts requires performance information for these groups and some understanding of the relationship between education in school and conditions outside school. Data on special-need populations and their performance are available from program data, HSB, and NAEP, but the data are inaccurate. And we lack the information to understand why children with special needs fall so far behind in school, despite evidence of progress in the earliest grades. If we are to measure the extent to which students fall behind early, we need detailed information on the school and outside environment in the formative pre-high-school years, data that are almost nonexistent.

Data Quality

The quality of data on elementary and secondary education varies greatly. Performance, as indicated by standardized tests, is one of the better-measured variables. NAEP, in particular, has devoted considerable effort to improving outcome measurements and has introduced a new scaling system that may permit comparisons across grades.

Estimates of high school dropouts are less satisfactory. In the drive to promote educational excellence, the high school dropout issue was initially swept aside. This appears to have been a serious mistake; evidence from several sources shows that the problem is severe. However, the reported high school dropout rates are error prone. Estimates from alternate sources differ on the extent of the problem and, in the absence of agreement on a baseline number, it is hard to gauge whether the dropout problem is improving or getting worse.

A dropout rate can be calculated from the CCD by comparing the residual of the number of high school graduates with the number of students in the 9th grade 4 years previously; this approach yields a dropout rate of 27 percent. In contrast, the CPS, which uses household interviews for information on educational attainment, reports a dropout rate of only 16 percent. The CPS does not, however, report how schooling was completed, whether through graduation from a regular high school program or other means, such as earning an equivalency certificate or external degree. The dropout rate can also be calculated from the HSB longitudinal study, but this rate is generally acknowledged to represent an undercount because it misses students who leave school before the end of their sophomore year.

School process variables pose similar problems; even the simplest are sometimes hard to measure. HSB, to its credit, compared student self-reports of courses and grades with coursework transcripts and found substantial misreporting. Unfortunately, quality control studies have not been carried out for other types of process data, such as information on school climate and order. Students' responses need to be validated against reports from teachers and administrators on these critical variables.

Data on the use of resources are so unreliable that assessing efficiency in American schools is quite problematic. Large, implausible year-to-year variations in per pupil expenditures appear for some states. Pupil-to-staff ratios calculated from state reports also are unreliable; for example, the highest and lowest state pupil-to-all-staff ratios differed by 140% on this measure in 1983. Either the reported numbers are faulty, or some states have remarkable efficiency advantages over others.

On the question of whether special populations are being well served by American education, the data are also suspect. A prerequisite for addressing this issue is agreement on the target populations; numbers for most of the federal target groups are at best questionable. For example:

- In 1984, special educational students as a proportion of State enrollment ranged from a low of 5% to a high of 13% (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 1985). There is no physiological explanation that could account for these report differences exceeding 100% in the prevalence of handicapping conditions.

- The Office of Bilingual Education and Minority Languages Affairs estimates that about 3.6 million language-minority children need bilingual services, but a recent study based on Census Bureau data concludes that two-thirds of the children included in this number use English as their usual or sole language, and thus could hardly be classified as candidates for instruction in a language other than English.

Finally, there is the difficulty of obtaining educationally relevant information on households, such as family income and parental reinforcement of education. This information appears to be far more accurately reported through home questionnaires rather than from student responses. HSB validity studies show that students may seriously misjudge family background characteristics; comparisons between students' and parents' reports of parental occupation, family income, and mother's work, for example, yielded validity coefficients of only about .5 (U.S. Department of Education, National Center for Education Statistics, 1984).

Statistical gathering by the federal government often involves inordinate time lapses between data collection and dissemination. Indeed, private organizations routinely publish similar data that are both more comprehensive

and more timely. For example, the CCD provides the location and enrollments of all elementary and secondary schools, but the most recent school year for which this information is available is 1982-83. In contrast, private firms have compiled similar files that provide much greater information on each school site for the 1984-85 school year. As a second example, the NEA regularly publishes state-level financial and staffing data for the preceding and current school years. These data are generally more complete than those the Education Department publishes and at least 1 to 2 years more current.

Data Linkages

The collage of elementary and secondary data bases provides cogent examples of the advantages of integrating performance data with other kinds of information. Two of the most successful information activities in the elementary and secondary school area, in terms of use and attention to findings, are HSB and the Education Department's "wall chart" which graphically profiles state-by-state comparisons on college entrance test scores and resource variables. By contrast, detailed financial statistics reported in isolation in the CCD or extensive library statistics tell little about school quality and, hence, are not widely used.

The data on teachers also points to the need to consider data collection as a cohesive whole. Five separate questionnaires from the Department of Education have recently sought information from the states about teachers: CCD, HSB, NAEP, Survey of Teacher Demand and Shortage, and a new Public School Survey. Yet after all these surveys, the Department still does not know how much each state pays its teachers.

DATA ON HIGHER EDUCATION

Education Secretary William J. Bennett has called for a rethinking of higher education--both its funding and its functions. Questions have been raised concerning access, cost, quality, and the role of higher education in the United States today. Because student aid accounts for nearly half of all the Department of Education's spending, the government needs to know if the aid is being properly targeted and wisely spent. Institutional efficiency is also being questioned in relation to rapidly rising tuitions and purported decreases in faculty teaching loads. Indications of declining performance and unbalanced curriculums, moreover, call into question the very quality of higher education. The trend toward greater vocationalism in college studies, along with increased corporate training, stimulates concern that higher education is not fulfilling its mission.

Data sources presented in Table 3 are considered in this section as they pertain to these issues:

- o Student aid. Who receives federal student aid and how can aid be refocused to provide greater access to the most disadvantaged students?

- o Efficiency. Why have tuition charges increased faster than the inflation rate, and how can escalating costs be contained?

- o Value. What is the quality of the educational experience and of college graduates? What is being learned?

- o Role. What is the role of higher education, particularly in relation to occupational and corporate training?

Information on higher education is obtained by a diverse group of government and private organizations. At the federal level, the Higher Education General Information Survey (HEGIS) of NCES collects information from all institutions of higher education on enrollment, institutional control and finance, degrees conferred, and faculty employment and salaries. Other information is obtained by a series of surveys also sponsored by NCES; these include the National Longitudinal Study of the High School Class of 1972 (NLS), HSB, and the Survey of Recent College Graduates. In an October supplement the CPS collects data on college enrollment by control of institution (public or private), and family demographic and social characteristics. NSF surveys gather data on scientific and engineering education. The Labor Department's longitudinal study (NLS--Youth) tracks the work and education experience of young adults.

Sometimes specific information can be obtained only from sources outside of the government. The College Board's Annual Survey of Colleges, for example, is a comprehensive survey that queries institutions on admissions policies, student charges, standards, and fields of study. The American Council on Education (ACE) conducts approximately six Higher Education Panel (HEP) surveys each year on topics of special interest. The National Institute on Independent Colleges and Universities (NIICU) surveys student aid in private colleges; the National Association of State Colleges and Universities collects an analogous public college survey. The Cooperative Institutional Research Program (CIRP) surveys first-time freshmen, while the National Association of College and University Business Officers (NACUBO) quantifies endowment levels. As further examples, the American Association of University Professors (AAUP) and the Council for Financial Aid to Education (CFAE) report faculty salaries and voluntary support to higher education, respectively.

Data Coverage

The Reagan administration's 1986 budget recently proposed modifications in the federal student aid programs to better target benefits to the neediest students. Documenting the trends in aid recipients, though, has proved difficult and controversial. The problem is not that the information is insufficient, but that different sets of data are disjointed and cannot describe the total

student aid package in relation to students' financial need. Once again, the problem is linkage rather than coverage.

The efficiency of the higher education production process is another issue. In recent years, college tuitions have risen faster than the inflation rate. Has efficiency in the production of higher education changed? Information to address this question would certainly include data on credit hours taught per faculty member, time divided between research and teaching, and class size and unit costs of different course offerings.

HEGIS, the principal federal data base to address these questions, collects data on number of faculty members and salaries, enrollment, revenue, and expenditures. Yet HEGIS data do not help us answer questions of efficiency. Faculty salaries are not reported according to the amount of time spent on research, as opposed to teaching. And information is not provided on credit hours taught or on class size from which unit costs by course offering could be calculated.

HEGIS fiscal data are aggregated at the institutional level, a practice that precludes reporting resource allocations among academic departments and levels. The extent to which costs, for instance, in the sciences are subsidized by humanities departments, or graduate programs by undergraduates, is not available. In addition, although it is generally assumed that the expansion of programs and course offerings has been costly and inefficient, no figures are available with which to measure the expense of offering a multiplicity of courses.

Alternative sources for certain information about higher education inputs are available, but little is known about the efficiency with which resources are allocated. The AAUP publishes annual salary statistics for college faculty by rank but reports nothing on teaching loads. It has been suggested (Noah, 1985) that teaching loads have been cut substantially over the past four decades, yet this claim cannot be corroborated because no national survey divides faculty time among teaching, research, and other endeavors.

There have also been recent expressions of concern about the value and diversity of the college course of study. "Although more than 50 percent of America's high school graduates continue their education at American colleges and universities," writes Secretary Bennett (1984), "few of them can be said to receive there an adequate education in the culture and civilization of which they are members." Information on course enrollments by subject area and on the extent of remediation would be helpful. Test scores would indicate what students actually learned in courses. The apparent growth in remediation would suggest a "dumbing down" of coursework in colleges. Although detailed information is available about the major fields of graduates, little is known about the courses graduates took outside their fields. For example, HEGIS reports the number of men and women receiving degrees in home management, but not the number of courses taken by students who major or do not major in the humanities. ACE surveys indicate total credit hours in selected science and humanities programs, but the data do not permit translation of these credit hours to individuals.

TABLE 3: VARIABLE CATEGORIES COVERED BY SELECTED HIGHER EDUCATION DATA BASES

Data bases	Outcomes	Processes	Resources	Student background
Education Department				
Higher Education General Information Survey (HEGIS)	◺	--	▭	--
National Longitudinal Study of the High School Class of 1972 (NLS)	◺	--	◺	--
High School and Beyond (HSB)	◺	--	--	▭
Survey of Recent College Graduates	◺	--	--	◺
Other Federal Agencies				
Current Population Survey (CPS)	◺	--	--	◺
National Science Foundation (NSF): Surveys of Science and Engineering Expenditures, Federal Support, Personnel, and Graduates	◺	--	◺	--
National Longitudinal Survey--Youth Cohort (NLS--Youth) (Labor Department)	▭	◺	--	▭
Private Organizations				
National Institute on Independent Colleges and Universities (NIICU): Survey of Student Aid Recipients	--	--	◺	▭
National Association of State Colleges and Universities (NASCU): Survey of Student Aid Recipients	--	--	◺	▭
College Board: Annual Survey of Institutions	--	▭	◺	--
Cooperative Institutional Research Program (CIRP): American Freshman Norms	--	--	--	◺
American Council on Education (ACE): Higher Education Panel (HEP)	--	◺	◺	--
National Association of College and University Business Officers (NACUBO): Comparative Performance Study and Investment Questionnaires	--	--	◺	--
American Association of University Professors (AAUP)	--	--	◺	--
Council for Financial Aid to Education (CFAE)	--	--	◺	--

▭ = Complete data ◺ = Incomplete data -- = Blank

Data that would quantify the returns to a college education in terms of increased knowledge also are lacking. No uniform test, such as the Graduate Record Examination, is given to a representative sample of graduates to test their general knowledge. One study of changes over the past two decades found significant declines in graduate admissions test scores in most fields (Adelman, 1984), but these results were not drawn from statistically representative sample of all graduates, because only those intending to go to graduate school took the exams.

Of concern is the quality of graduates produced by various programs and in different fields, particularly graduates of teacher education programs. Beyond the NLS study of members of the 1972 high school class who went into teaching, little definitive is known about the quality of graduates prepared to teach. The Survey of Recent College Graduates asked for grade-point averages, but this measure is a poor indicator of quality and no substitute for college transcript data. College transcripts would give not only grades but actual courses that would suggest the extent to which teaching graduates are fully prepared in their subject matter or were enrolled in watered-down courses.

Concern has also arisen over the mission of higher education in relation to other providers of postsecondary training. Some observers charge that higher education, particularly in community colleges, has become indistinguishable from vocational training. Conversely, corporate training is being provided in areas traditionally reserved for universities and colleges. These developments suggest the need for information about the extent of the overlap and the relationship between training provided by businesses and postsecondary institutions. For that matter, the academic-occupational mix in college programs remains an important unknown, critical to assessing higher education's role in relation to the role of other postsecondary providers.

Data Quality

Although many data sets provide information about the specific policy issues raised here, multiple sources often result in conflicting and incomplete overall higher education policy evaluations. Both the HEGIS and CPS, for example, report enrollment, but tabulations differ even for this most basic statistic. The two surveys basically agree on total enrollment but show discrepancies by full-time/part-time status and 4-year/2-year disaggregations and wider differences by graduate/undergraduate breakdowns. For example, CPS estimates graduate school enrollment to be one-third larger than the figure reported through HEGIS, although in other categories CPS finds fewer students than HEGIS.

Although HEGIS remains the federal government's primary instrument for monitoring higher education, the periodicity of many of these surveys has been interrupted in recent years. Because of processing delays and technical difficulty, NCES has abandoned attempts to release the 1982-83 data on faculty salaries and some of the financial and degrees data. Even in years without abnormal delays, HEGIS data were not available to analysts until approximately two years after the surveys were taken.

Data Linkages

A major problem associated with higher education data is that information from multiple sources cannot be combined to form a complete picture. The relationship between student aid and financial need provides an example of the lack of linkage among data sets and the difficulty this causes to analysts.

Any evaluation of student aid programs requires an understanding of the income distribution of students' families and the types and amounts of aid these students receive. These are important policy considerations, especially given the debate over proposed federal funding reductions.

The fundamental problem with student aid information is that it is collected for administrative purposes by those responsible for each program. Hence, coverage may not be a problem, but organization is. Because the information is generally not consolidated into files that cover all student aid programs, it is impossible using federal data bases, to determine how the need for student aid is distributed and how federal aid combines with other revenue sources to meet this need.

Two private sources of student aid information, however, cut across programs and could provide the needed data. Identical questionnaires concerning student aid are sent to both public and private institutions for the National Association of State Colleges and Universities (NASCU) and the National Institute on Independent Colleges and Universities (NIICU), respectively. These surveys could, if merged, provide the information needed for policy analysis and discussion. The Education Department can obtain the NASCU public college data, but NIICU will not make available the private college data tapes.

The problem, again, is that much of the information useful for analyzing the higher education process is piecemeal, serving only the specific needs of the originating agency. Some national coordination for these blocks of data would vastly improve the information base.

RECOMMENDATIONS FOR IMPROVING NATIONAL DATA

The tremendous national interest in educational improvement provides the impetus for reform of our national base of educational statistics, but the task will not be easily accomplished. Inertia and special interests will work against developing a coherent data collection strategy. Policymakers may be unwilling to wait for real improvements.

Given these problems, identifying a clear agenda becomes all important for improving national statistics. Extensive analysis is needed before a complete set of reforms can be specified. Analysts must carefully investigate the design options for data collection before final decisions on implementation are made. Resource and political constraints also will impose trade-offs among options. Our purpose in setting forth this agenda is to identify the most important directions for reform. We have divided our recommendations along the three types of evaluation criteria used throughout this paper: data coverage, data quality, and data linkages.

Data Coverage

The federal government needs to ask the important questions and collect data accordingly. It already collects a considerable amount of educationally related data, but some of the data now collected may have relatively little policy value, whereas other data not now gathered may have high informational value.

Recommendation 1: Eliminate low priority data items.

The continued collection of data with little policy worth cannot be justified. A comprehensive reconsideration of survey instruments requires a item-by-item analysis, but various candidates for paring are evident. They include the following:

- Annual HEGIS collection of degrees awarded by sex, for six-digit degree codes at the subbaccalaureate level that include facts such as the number of female degree recipients in fashion merchandising or jewelry marketing;
- Library statistics on book binding costs and number of audiovisual materials; and
- Annual CCD collection of school district finances detailing expenditure and revenue statistics for all 16,000 school districts.

Recommendation 2: Identify and fill information gaps on a priority basis in areas of major policy interest.

Some gaps in the data can be filled by adding items to existing surveys without incurring substantial costs, and these efforts should proceed. Examples include:

- Adding questions on preprimary education to the CPS to differentiate provider types and extending coverage of this item to estimate the number of children in home day care;
- Requesting teacher salary data by state as a regular part of the CCD;
- Including on the CPS a question on how high school was completed, whether through graduating from a regular 4-year program or by earning an equivalency certificate or external degree;
- Adding questions to HEGIS about number of faculty hours spent teaching as a rough measure of instructional load; and
- Adding a college transcript collection to the Survey of Recent College Graduates.

Supplementing existing surveys will not, by itself, produce much of the new data needed to resolve many of the most glaring deficiencies in policy information needs. These deficiencies include the following:

- o Preprimary education. Little is known about the organization and support for preprimary education, the nature or quality of these programs, and the relationship between preschool and home learning.

- o Elementary school. No recent study describes how course content relates to outcomes. Of special interest at this level would be information on the use and effectiveness of alternative teaching approaches to development of reading and mathematics skills. NAEP may begin to yield information on coursework in the 4th grade, but additional data are needed to describe how learning at this level relates to learning before and after this grade.

- o Junior high school. Two areas deserve special attention: First, the adolescent years are ones in which behavioral problems of students become serious. Many youths may drop out of school at this level, yet national data about attrition in junior high is lacking. Information on how discipline and dropout problems develop may require longitudinal data collection at the junior high level. Second, deficiencies in higher-order thinking skills surface in adolescence, and these deficiencies need to be related to course-taking and schooling processes.

- o Higher education student aid. The primary problem is the absence of a file for each student that shows aid from all sources in relation to need. This consolidated record is essential for analyzing the effects of student aid reforms.

- o College learning. Except for the number of degrees granted and the unrepresentative graduate admission exam scores, there is little or no information on the learning that takes place in college or even on the distribution of coursework.

This rather long list unfortunately reflects the sorry condition of current national statistics. In view of financial and staff limitations, priorities must be established. Attention must be paid to state-of-the-art problems in developing designs that yield reasonably cost-effective information payoffs. Examples of the difficulties involved in conducting surveys include the following:

- o Preprimary education occurs in myriad settings, the most important of which may be the home. The universe of settings is poorly defined; master lists to draw samples often do not exist. Distinctions between nursery, kindergarten, preschool, and day care may be only nominal. Studying classroom processes at the preprimary level may require the use of detailed and costly observational techniques.

- o Previous attempts to measure schooling processes at the elementary level have yielded little useful information. The Sustaining Effects Study, a $20 million longitudinal study in the mid-1970s, thoroughly examined elementary schools, yet told very little about effective elementary schools and classrooms. For that matter, it even failed to achieve its primary objective of settling the debate over the long-term effectiveness of compensatory education programs.

- o Colleges, in particular, and postsecondary institutions, in general, are extremely diverse, and it is not at all clear how to measure outcomes for these institutions.

In view of these methodological and definitional considerations and differing policy priorities, experts will disagree over subjects to pursue. Among this list, the two activities we recommend for highest initial priority are these: (1) the junior high school study, because schooling in these grades may be the key to rejuvenating the high school and because so little is known about processes at this level; and (2) the student aid study, because this issue is of extreme immediate importance. In other areas, conceptual and measurement efforts are clearly needed and should begin at once. For example, efforts to separate educational from custodial services at the preprimary level and to develop of appropriate measures of learning at the college level should be pursued.

Data Quality

Inaccuracies and inconsistencies in Education Department statistics pose serious problems. Once data are published, they become accepted as fact, regardless of the caveats that may accompany their publication. In some instances, the reader is not even warned of data weaknesses. These concerns over data quality are not new ones, but seemingly they arise, year after year, with little improvement. The Education Department should immediately begin to address the problems of improving the adequacy of its data.

Recommendation 3: Establish an office of quality control.

No such office now exists within the Education Department, nor has any office promulgated a set of standards to ensure adequate data quality. An office that has this function as its primary responsibility is essential to the job of improving data quality. This office should be independent of the data-collecting offices and should oversee data collection of both general purpose statistics and program data.

Recommendation 4: Give highest priority to improving the quality of elementary and secondary education data.

Although all information must be subject to quality control reviews, the most glaring accuracy problems relate to elementary and secondary education data. The states must be held accountable for providing the Department of Education with consistent and accurate data.

The failure of certain data to pass muster when subjected to external validity checks must be immediately addressed. In particular, differences between NCES and Census Bureau data on estimated dropout rates and private school attendance can no longer be ignored simply because of organizational divisions at the federal level. The two organizations should immediately establish a joint review group to assess the reasons for inconsistencies in the data each collect.

Recommendation 5: Modernize procedures for data collection.

NCES has had problems of providing timely data, especially with some of its larger surveys such as CCD and HEGIS. Several types of reforms could improve the currency of information. Using the telephone instead of a mailed questionnaire would speed collection of school universe data. When there are a limited number of respondents, such as 50 states, computer networks seem to be a sensible approach. Once data are collected, they should not languish. Analysis contracts should be built into the overall data collection effort to expedite reporting of the data.

Data Linkages

The number of distinct data collection instruments related to education is quite large. The approximately 35 data bases reviewed in this study are only a partial listing. These activities lack cohesiveness. Although a master plan relating all data collection efforts would be quite unwieldy, far too little attention is now paid to the advantages that could be derived from coordinating or combining related efforts.

No one reason explains why coordination of national data-gathering activities has not progressed. Sometimes the reasons are historic. New data collections were planned for specific purposes and the planners paid inadequate consideration to whether these purposes could be better met through existing activities. Moreover, data needs may be defined so narrowly that the benefits of an integrated data set are not perceived. At other times, the problem is bureaucratic. It is unnatural to expect one statistical division or agency to transfer its responsibility to another. Whatever the reason, the limited federal funds available for education statistics make coordination of data activities imperative.

Steps the Education Department should consider to strengthen linkages among its statistical activities include the following:

Recommendation 6: Investigate the feasibility of linking the most costly data collection systems in the Department of Education.

Longitudinal data and performance assessments are acknowledged to be high-budget items. If we can detach ourselves from the ways data systems are currently organized and administered, we may see some alternatives for collecting information. Take, for example, the NAEP. Many would say that NAEP has had limited usefulness because it could not be linked directly to school policies and practices. Prior to the 1983-84 assessment, performance measures could be tied to only a few student characteristics and to no curriculum or process variables. The recent release of preliminary NAEP data suggests that the inclusion of fairly comprehensive student and teacher questionnaires will prove most valuable.

Other tie-ins to major outcome assessment activities should be considered. In particular, the question should be raised as to whether the distinctions between repeated cross-sectional studies, such as NAEP, and longitudinal studies, such as HSB, are real or artificial. For example, attaching a small longitudinal component to the NAEP 7th grade sample might provide a measure of the extent of attrition at this early level. The relationship among longitudinal surveys also should be considered, such as, for instance, how NCES longitudinal surveys could be coordinated with the Labor Department's NLS--Youth survey which also obtains longitudinal cohort data. Both HSB and Labor's Youth Cohort have transcript studies that, coincidentally, are being directed by the same contractor.

Recommendation 7: Initiate informal discussions with representatives of Departments of Education, Health and Human Services, and Labor, and the Bureau of the Census to coordinate data collections.

Data collectors in the private sector also should be brought in to the discussions.

Recommendation 8: Consider, when developing questionnaire items, those variables that have been shown to be most important to educational outcomes.

Statisticians and survey monitors should draw upon recent school effectiveness studies to help frame survey instruments.

Recommendation 9: Establish an education data bank to improve survey consistency across data bases and over time.

This data bank would pool items related to education within and outside government and might include items used in state and local surveys and case studies.

Recommendation 10: Keep expectations high.

We might take a cue from recent research on HSB which shows the power of positive thinking and persistence on student performance. Despite limited funds, national data collections can be improved. Because funds are limited, greater efficiency it is important to promote in our information systems. In

addition, data producers should call attention to and take credit for the policy payoffs from study findings.

In addressing 1985 college graduates, Secretary Bennett offered some sound advice: "It is practical optimism that I recommend." As we consider reforming national statistical collections, we must think practically and optimistically about the task ahead.

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